Hygoairo®

ULTRAVIOLET AIR DISINFECTION

Owner's Manual

Installation, Operation & Maintenance

ATLANTIC ULTRAVIOLET CORPORATION®

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These instructions generally describe the installation, operation and maintenance of the ***Hygeaire®*** line of Indirect Ultraviolet Room Air Sanitizers, Models LIND 24-EVO and LIND 24-EVO-2PM. Questions that are not specifically answerable by these instructions should be directed to the Factory.

Atlantic Ultraviolet Corporation takes all possible precautions when packaging equipment to prevent damage. Carefully inspect and report all damages. Do not install damaged equipment.

Follow all instructions on any labels or tags. Carefully inspect all packing materials before discarding to prevent the loss of accessories, mounting hardware, spare parts or instructions.

ATLANTIC ULTRAVIOLET CORPORATION®

SAFETY WARNINGS

- All personnel should be alerted to the potential hazards indicated by the product safety labeling on this fixture.
- The following conventions are used to indicate and classify precautions in this manual and on product safety labeling. Failure to observe precautions could result in injury to people or damage to property.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Danger indicates an **IMMINENTLY** hazardous situation, which, if not avoided, **WILL** result in death or serious injury.

⚠WARNING Warning indicates a **POTENTIALLY** hazardous situation, which, if not avoided, **COULD** result in death or serious injury.

⚠CAUTION Caution indicates a **POTENTIALLY** hazardous situation, which, if not avoided, **MAY** result in minor or moderate injury.

CAUTION Caution used without the safety alert symbol indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

This symbol/pictorial is used to identify an **ELECTRICAL SHOCK** or **ELECTROCUTION** hazard.

This symbol/pictorial is used to identify an **ULTRAVIOLET LIGHT** hazard.

This symbol/pictorial is used to identify the need to wear approved ultraviolet resistant eyewear.

This symbol/pictorial is used to identify the need to wear protective gloves.

- Product safety labels should be periodically inspected and cleaned, as necessary, to maintain good legibility. Always replace illegible safety labels. Contact factory to obtain replacement safety labels.

SAFETY INSTRUCTIONS

⚠ **WARNING: To guard against injury, basic safety precautions should be observed, including the following:**

1. Read and follow **ALL** safety instructions.
2. ⚠ **WARNING: Avoid exposure to direct or strongly reflected germicidal ultraviolet rays. Germicidal ultraviolet rays are harmful to the eyes and skin.**
3. Intended for indoor use only.
4. Do not alter the construction or design.
5. Do not override safety interlock.
6. Do not remove safety labels or devices.
7. ⚠ **CAUTION: Do not operate without proper electrical ground.**
8. Do not operate without louver panel secured.
9. Use personal protection equipment, such as gloves, long sleeves with no gaps between cuffs and gloves, and an ultraviolet resistant face shield, when entering the irradiated space above 6 ½ feet.
10. Utility power supplied, to the fixture, **MUST** match power requirements listed on the System label.
11. Always disconnect power, from the fixture, before performing any maintenance.
12. Read and follow all notices and warnings on the fixture.
13. **SAVE THESE INSTRUCTIONS**.

PRODUCT APPLICATION

CONSTRUCTION

The ***Hygeaire®*** brand fixtures are categorized as indirect type germicidal fixtures, which utilize germicidal lamp(s) with a series of louvers to direct ultraviolet rays to the upper areas of a room, thereby destroying bacteria and viruses that are carried into the ultraviolet field by convection currents or air circulation.
The ***Hygeaire®*** consists of; a Louver Panel, Parabolic Reflectors with specular aluminum inserts, Electronic Variable Output Ballast, Germicidal Lamp, and Stainless Steel Housing.

LIMITATIONS

Hygeaire® requires knowledgeable planning for; location, installation, and continued supervision to prevent exceeding the ultraviolet radiant exposure incident Threshold Limit Value (**TLV**) set by the American Conference of Governmental Industrial Hygienists. Currently the ultraviolet radiant exposure incident for unprotected skin or eyes should not exceed 0.2 microwatts per square centimeter (**μW/cm^2**) at 254 nanometers (**nm**) for an eight (**8**) hour period.
Hygeaire® requires professional installation so all wiring complies with applicable local and national electrical codes. Installation is permanent, and relatively inflexible.
Safety and maintenance procedures should be implemented to prevent accidental exposure of personnel, who might enter the irradiated space (Electricians and other trades people in particular). All work performed (painting, new ceilings, equipment or fixture installation, etc.) in the irradiated space must be monitored to insure that they do not adversely impact the safety or effectiveness of the installation.

IINSPECTION

Remove the ***Hygeaire®*** fixture from its shipping carton. Inspect the fixture, and wire leads for damage. Do not operate if there is any damage to the fixture, and/or wire leads. Lamp(s) are packed separately, to ensure maximum protection to the lamp(s). Keep the lamp(s) aside until ready for installation. When installing lamp(s) into the fixture, exercise care not to touch the lamp's glass. Oils deposited, from fingers, on the glass could effect ultraviolet transmission.

The ***Hygeaire®*** Model LIND 24-EVO fixture includes:

- 1 - Model LIND 24-EVO single lamp fixture with 6 inch lead wires
- 1 - Germicidal Ultraviolet Lamp
- 1 - Operating Instructions

The ***Hygeaire®*** Model LIND 24-EVO-2PM fixture includes:

- 1 - Model LIND 24-EVO-2PM dual lamp fixture with 4 ½ foot lead wires
- 1 - Pendant Mounting Kit, consisting of:
  - 1 - #19 Crossbar
  - 1 - #11 Canopy
  - 2 - 3/8" IP Stems 18 inches long
  - 2 - #14 3/8" IP Slip Rings
  - 6 - #22 3/8" IP Locknuts
- 2 - Germicidal Ultraviolet Lamps
- 1 - Operating Instructions

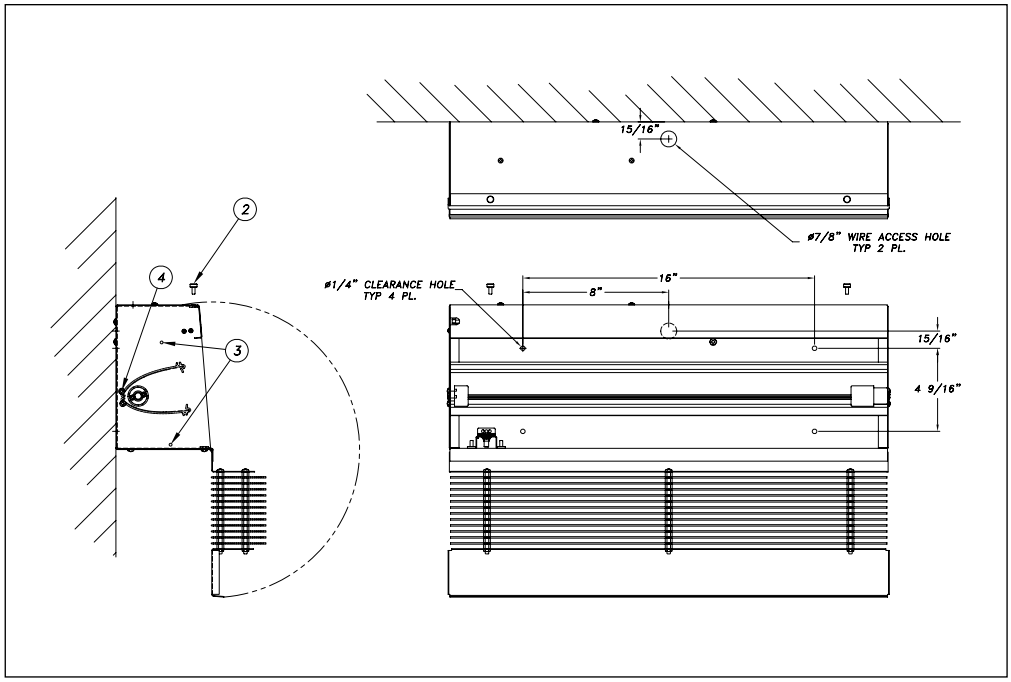
INSTALLATION

LOCATION

- The ***Hygeaire®*** fixture is recommended for use in rooms with good ventilation, with a ceiling height of 9 feet or more and where occupants remain for prolonged periods.
- Access to the room does not need to be controlled while the fixture is operating.
- The louver panels of the ***Hygeaire®*** fixtures protect room occupants from ultraviolet exposure, by directing ultraviolet radiation into the upper areas of the room.
- Any plans for the installation of the ***Hygeaire®*** fixtures, should take into account the reflectance of the ceiling. Some finishes may have reflectances that are objectionably high, making exposure of more than a few hours unsafe. If any help is needed in determining the reflectance of a surface, please contact the Factory.
- Ultraviolet energy, produced by the germicidal lamp(s), can fade some colors and/or alter the surface of some materials especially those directly irradiated by the lamp(s). If any help is needed in determining the ultraviolet resistance of any material, please contact the Factory.
- The ***Hygeaire®*** LIND 24-EVO fixture is designed to mount horizontally on a vertical surface, or wall, approximately 6 ½ to 7 feet above the floor.
- The ***Hygeaire®*** LIND 24-EVO-2PM fixture includes pendant hardware to suspend fixture from the ceiling. Standard stem pipe length is 18 inches. Other lengths are available, contact the Factory with requirements.

INSTALLATION OF LIND 24-EVO

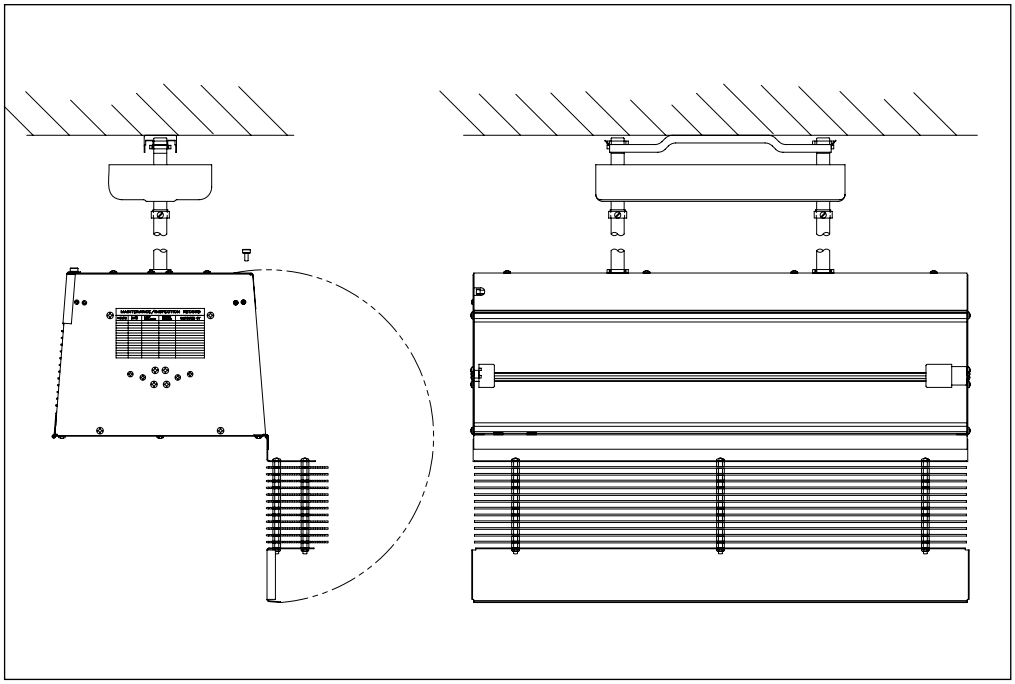
Figure 1 - LIND 24-EVO Installation



1. The fixture is to be mounted on a plumb, vertical surface, at a minimum height of 6 ½ to 7 feet from the floor. Installation must be able to support approximately 16 pounds.
2. Remove thumbscrews and open fixture to expose interior lamp holders and reflectors.
3. Remove one mounting screw from each end of the reflector so that the reflector will be able to pivot toward the lamp holder.
4. Pivot reflectors, on remaining screws, to expose the rear mounting holes and 7/8-inch wire access hole.
5. All wiring should confirm to state and local electrical codes as well as the current National Electrical Code (NEC).
6. After mounting and wiring, pivot reflectors back into place and replace mounting screws. Install lamp (packed separately), close fixture and replace thumbscrews.

INSTALLATION OF LIND 24-EVO-2PM

Figure 2 - LIND 24-EVO-2PM Installation



1. Installation and all wiring should confirm to state and local electrical codes as well as the current National Electrical Code (NEC). Installation must be able to support approximately 32 pounds.
2. After fixture is mounted and wired, open louver panels by removing thumbscrews. Install lamps (packed separately), close panels and replace thumbscrews.

RECOMMENDED OPTIONS

1. **Zenith™** Ultraviolet Meter: Provides accurate Easy-To-Read Levels of Intensity that may be interpreted by anyone, not just engineers. **Zenith's™** design makes it insensitive to ambient lighting within the area being surveyed.

PRECAUTIONS

Immediately following initial installation of the ***Hygeaire®*** fixture, the occupied area, of the room, should be surveyed with the **Zenith™** Ultraviolet Meter, to insure that the ultraviolet radiant exposure of personnel is within acceptable limits. Thereafter this procedure should be repeated whenever any maintenance is performed, including lamp changes or whenever maintenance or repairs are performed in the vicinity of the fixture. In addition, procedures should be adopted to insure that the fixture is switched off whenever personnel are working above the 6-foot level. Personnel who work in and around the treated area should be briefed on the benefits and the precautions to be observed.
If there are any doubts or questions about the safety or the effectiveness of the installation, or if a sensitive ultraviolet meter is required, please contact the Factory.

MAINTENANCE

The ***Hygeaire®*** is designed to operate with a minimal amount of maintenance. Besides occasional ultraviolet measurements to insure that ultraviolet intensities in the treated areas remain within the allowable exposure limits and above minimum levels, a regular cycle of cleaning, the germicidal lamp and interior reflectors, should be established based on visual inspection and experience. The frequency of cleaning will vary with the conditions surrounding each installation. It is recommend that the germicidal lamp(s) and interior reflectors be cleaned at least every three (3) months.
The germicidal lamp used in the ***Hygeaire®*** fixture is a high output instant start lamp with a rated average effective life of 10,000 hours. For maximum efficiency, lamp replacement is recommended every 10,000 hours of operation.
Personal protection equipment is required only when entering the irradiated space, above 6 ½ feet from the floor, or when opening the louver panel, with the germicidal lamp operating. Personal protection equipment would include skin and eye protection such as gloves, long sleeves with no gaps between cuff and gloves, and an ultraviolet resistant face shield.
The ***Hygeaire®*** is equipped with a safety interlock switch that will shut down the germicidal lamp when the louver panel is opened.

⚠ **CAUTION: Do not override safety interlock switch. Operation of the fixture with the override of the interlock switch and louver panel open will expose personnel to direct or strongly reflected germicidal ultraviolet rays. Germicidal ultraviolet rays are harmful to the eyes and skin**.

ULTRAVIOLET OUTPUT ADJUSTMENT

If after a survey of the occupied area of the room shows the ultraviolet radiant exposure of personnel is not within acceptable limits, the output of the ***Hygeaire®*** fixture must be adjusted. The electronic variable output ballast controls germicidal ultraviolet lamp output. The remote potentiometer, used for output adjustment, is recessed in the base of the fixture. Access, to the potentiometer, is limited by a ½" ID plug which must be removed before any adjustments can be made.

1. Locate and remove protective plug.
2. Carefully insert a small flat bladed screwdriver, through the clearance hole in the fixture, into the slotted shaft of the potentiometer. Slowly turn the shaft until desired output is reached. Turning shaft clockwise increases output, while turning the shaft counterclockwise decreases output.
3. Replace protective plug.

CLEANING GERMICIDAL LAMPS

⚠ **CAUTION: Germicidal lamps are easily damaged. Exercise care when removing or replacing lamps.**

1. Shut down power to the fixture, and disconnect fixture from utility power source, if possible.
2. Open the louver panel, by removing the two (2) thumbscrews.
3. Carefully remove the germicidal lamp(s), from the telescoping lamp holders. Wipe down the lamp using a clean, soft rag and denatured alcohol. After cleaning, re-install lamp(s) into the fixture, exercise care not to touch the lamp's glass with your fingers.
4. Finally remove any visible dust from the interior of the fixture with a clean, soft rag or vacuum cleaner.
5. Close the louver panel and re-install thumbscrews.
6. Reconnect fixture to utility power, and restart fixture.

DISPOSAL OF MERCURY ADDED LAMPS

Germicidal ultraviolet lamps, like standard fluorescent lamps contain small amounts of mercury. Mercury added lamps should not be placed in the trash. Dispose of properly.
For further information regarding the disposal and recycling of lamps containing mercury, along with Federal and State requirements visit http://www.lamprecycle.org. Product Data Sheets for germicidal ultraviolet lamps can be found in the "PDF Library for **Ster-L-Ray**™ Germicidal Ultraviolet Lamps" section of http://www.ultraviolet.com.

TROUBLESHOOTING

⚠ **CAUTION: Always disconnect power to the fixture, before performing any service.**

Use personal protection equipment, such as gloves; long sleeves with no gaps between cuffs and gloves, and ultraviolet resistant face shield, if troubleshooting ***Hygeaire®***.

- **IMPORTANT**: This fixture is to be serviced ONLY by qualified, and appropriately licensed, personnel.

Table 1 - Troubleshooting

Problem	Possible Cause	Corrective Action
Fixture not operating.	No electrical power…	Verify that the purifier is connected to a live power source.
	Power connections, to fixture, loose or disconnected…	Verify power connections to fixture are fully engaged.
Germicidal lamp not operating.	Lamp(s) not installed…	Install lamp(s).
	Germicidal lamp not properly seated…	Confirm connection of lamp and lamp holder, make sure connection is tight and lamp holder is making full contact with lamp.
	Germicidal lamp faulty…	Swap suspect lamp, with lamp known to be good. If suspect lamp does not operate, replace lamp.
	Ballast not functioning…	Locate ballast and replace.
	Interlock Switch open…	Confirm louver panel is closed and secured.
	Interlock Switch faulty…	Replace Interlock Switch.

TECHNICAL SPECIFICATIONS

Table 2 Technical Specifications

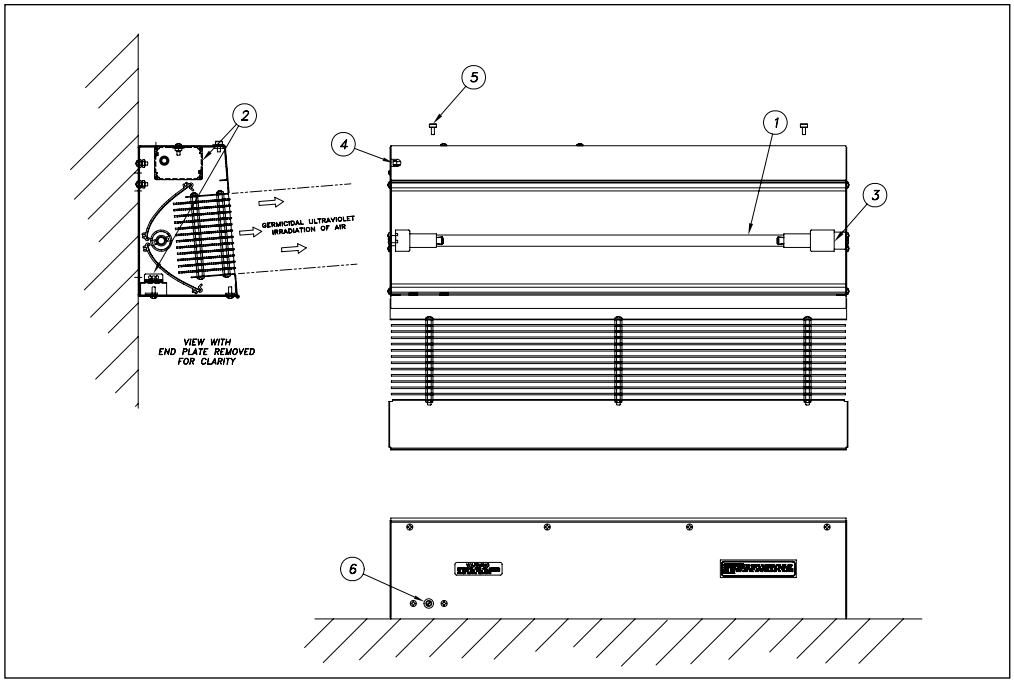
MODEL		LIND 24-EVO		LIND 24-EVO-2PM	
	Length:	24"		24"	
Dimensions:	**Width:**	4½"		9"	
	Height:	7-⅞"		7-⅞"	
	Volts:①	**120v**	**220-240v**	**120v**	**220-240v**
Electrical:	**Amps (Max):**	**.42A**	**.23A**	**.83A**	**.45A**
	Frequency:	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Total Ultraviolet Output:①		8.5 Watts		17 Watts	

① Ultraviolet output at 254 nm at 100 hours and 80° F (approximate).

② 120v 50/60Hz and 220-240v 50/60Hz units are standard - specify when ordering. Consult factory with other specific power requirements.

LIND 24-EVO

Figure 3 - Replacement parts Model LIND 24-EVO



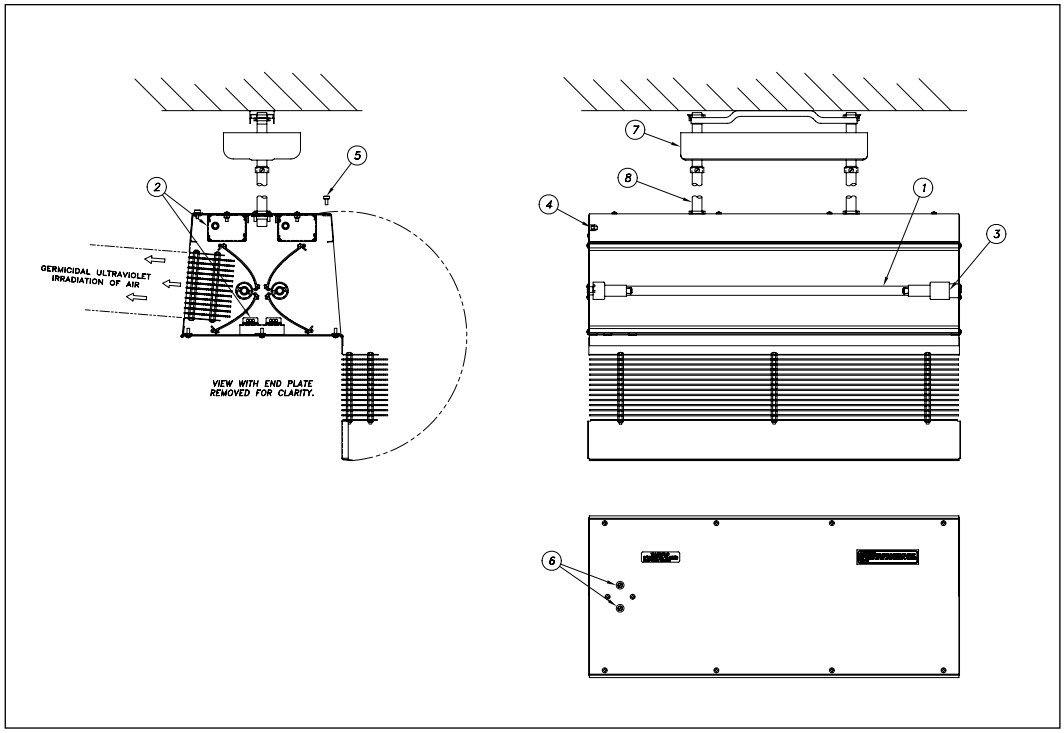
Item No.:	Description:	Quantity:	Part No.
1	Germicidal Ultraviolet Lamp, G24T6L	1	05-1348
2	Electronic Variable Output Ballast, 120v 50/60Hz	1	10-0056B
	Electronic Variable Output Ballast, 220-240v 50/60Hz		10-0055B
3	Lamp Holder Set	1	05-1320A
4	Safety Interlock Switch	1	35-0008A
5	Thumbscrew, 8-32 x 3/8" Lg	2	50-0080
6	Plug, ½" ID	1	00-0027

Other replacement parts are available. Consult the Factory for specific requirements.

REPLACEMENT PARTS

LIND 24-EVO-2PM

Figure 4 - Replacement parts Model LIND 24-EVO-2PM



Item No.:	Description:	Quantity:	Part No.
1	Germicidal Ultraviolet Lamp, G24T6L	2	05-1348
2	Electronic Variable Output Ballast, 120v 50/60Hz	2	10-0056B
	Electronic Variable Output Ballast, 220-240v 50/60Hz		10-0055B
3	Lamp Holder Set	2	05-1320A
4	Safety Interlock Switch	2	35-0008A
5	Thumbscrew, 8-32 x 3/8" Lg	4	50-0080
6	Plug, ½" ID	2	00-0027
7	Hanger, Canopy Set	1	40-0127
8	Hanger, Stem, 3/8" IP x 18" Lg	2	40-0129A18

Other replacement parts are available. Consult the Factory for specific requirements.

USER ASSISTANCE

Atlantic Ultraviolet Corporation makes every effort to ensure that the ***Hygeaire®*** Ultraviolet Air Disinfection Fixtures are products of superior quality and workmanship. This manual describes the installation, operation and maintenance of the ***Hygeaire®*** Ultraviolet Air Disinfection Fixtures.

Please read and become familiar with the contents of this manual before installing or using this fixture. If after reading the manual you still have questions, or concerns, regarding the installation or use of this fixture, contact our offices, weekdays between 8:30 am and 5:00 pm Eastern time, at:

Atlantic Ultraviolet Corporation
375 Marcus Boulevard
Hauppauge, New York, 11788

Tel: 631.273.0500
Fax: 631.273.0771

E-mail: info@ultraviolet.com
Website: www.ultraviolet.com

Please fill out and return the Owner Registration card immediately. If the card is missing from this manual, please contact any of our application specialists to obtain one.

Atlantic Ultraviolet Corporation takes all possible precautions when packaging equipment to prevent damage. Carefully inspect and report all damage. **Do not** install damaged equipment. Follow all instructions on any labels or tags. Carefully inspect all packing materials before discarding to prevent the loss of accessories, mounting hardware, spare parts or instructions.

For your convenience, record the following information below. The model and serial number can be found on a label located on the ***Hygeaire®*** Ultraviolet Air Disinfection Fixtures. Keep this manual, along with proof of purchase, handy when contacting our offices.

Purchased From:	Date:
Model:	Serial No.:

WARRANTY

We warrant that this product will be free from defects in material and workmanship for a period of one year from the date of shipment thereof or the product's total rated life, whichever first occurs. Within the warranty period we shall repair or replace such products, which are returned to us with shipping charges prepaid, and which are determined by us to be defective. This warranty will not apply to any product, which has been subjected to misuse, negligence, or accident; or misapplied; or modified; or repaired by unauthorized persons; or improperly installed.

The Buyer shall inspect the product promptly after receipt and shall notify us at our main office in writing of claims, including claims of breach of warranty, within thirty (30) days after the Buyer discovers or should have discovered the facts upon which the claim is based. Failure of the Buyer to give written notice of a claim within the time period shall be deemed to be a waiver of such claim.

The provisions of the above warranty are our sole obligation and exclude all other remedies or warranties, expressed or implied, including warranties of merchantability and fitness for a particular purpose, whether or not purposes or specifications are described herein. We further disclaim any responsibility whatsoever to the customer, or to any person, for injury to person, damage to, or loss of property or value caused by any product which has been subjected to misuse, negligence, accident; or modified or repaired by unauthorized persons; or improperly installed.

Under no circumstances shall the Company be liable for any incidental, consequential or special damages, losses or expenses arising from the contract for this product, or in connection with the use of, or inability to use, our product for any purpose whatsoever.

PATENT NOTICE

No attempt has been made to determine the patent status of applications illustrated or described in this publication. Inclusion in this publication of any design or method of use, which may be patented, is not to be construed as promoting or sanctioning unauthorized use.